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REPLY TO
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January 26, 1988
FVY 88-006

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Attention: Office of Nuclear Reactor Regulation
Mr. V. L. Rooney, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects I/II

References:
(a) License No. DPR-28 (Docket No. 50-271)
(b) Letter, V. L . Rooney (USNRC) to R. W. Capstick (VYNPC), "Approval of Use of Thermal-Hydraulic Code RELAP5YA (TAC No. 60193), Re: Vermont Yankee Nuclear Power Station," NVY 87-136, USNRC, dated August 25, 1987 (Docket No. 50-271)
(c) R. T. Fernandez and H. C. daSilva, Vermont Yankee BWR Loss-of-Coolant Accident Licensing Analysis Method, YAEC-1547, YAEC, Framingham, Massachusetts, June 1986 (Docket 50-271)
(d) R. T. Fernandez, et al., RELAP5YA: A Computer Program for Light-Water Reactor System Thermal-Hydraulic Analysis, Volume 1: Code Description, YAEC-1300P, YAEC, Framingham, Massachusetts, October 1982 (Docket 50-271)
(e) Letter, E. C. Johnson (EG&G Idaho, Inc.) to R. T. Fernandez (YAEC), "Transmittal of RELAP5/MOD1 Updates," ECJ 66-85, dated August 19, 1985
(f) Letter, R. W. Capstick (VYNPC) to V. L. Rooney (USNRC), "HUXY Computer Code Information for the Vermont Yankee BWR LOCA Licensing Analysis Method," FVY 87-63, VYNPC, dated June 4, 1987 (Docket No. 50-271)
(g) Letter, R. T. Fernandez (YAEC) to C. Graves (USNRC), "Supplemental Information on the HUXY Computer Code," LOCA 87-94, YAEC, dated June 10, 1987

Subject: Request for Supplemental Safety Evaluation Report Supporting the Use of RELAP5YA for Vermont Nuclear Power Station

Dear Sir:

By letter dated August 25, 1987 (Reference (b)), the USNRC transmitted their Safety Evaluation Report (SER) concerning Yankee Atomic Electric

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Company's (YAEC's) use of the RELAP5YA code for performing LOCA analysis for the Vermont Yankee Nuclear Power Station (VYNPS) subject to certain conditions and restrictions. We have reviewed the SER enclosed with Reference (b) and have completed additional work, described herein, that pertains to this SER. Specifically, we have completed the following:

1. Identified two typographical errors in the SER.

2. Incorporated RELAP5/MOD1 updates to valve subroutines that clarify coding text and correct coding errors.

3. Developed additional information concerning the HUXY code.

These items are discussed in further detail below.

Corrections to SER Text

Upon review of the SER (Reference (b)), we find a typographical error on Page 15, Section 2.5, Paragraph 2, Sentence 2. The number of fuel assemblies is 368, not 348 as typed. The correct number of fuel assemblies is stated near the bottom of Page 3 in Reference (c). A second typographical error is found on Page 18, Section 2.6, Paragraph I.A.5, Sentence 4. This last sentence should read as follows:

> YAEC states that the ruptured node length will not be less than 3" for licensing calculations.

This correction will then be consistent with our last sentence on Page 258 of Reference (d) and the Appendix K requirements in Paragraph I.A.5.

Valve Component Updates

Regulatory Position 3 in Section 3.0 of the SER identifies four restrictions on YAEC's use of certain specific models. These specific models are identified as Items 1 through 4 in Section 2.3 of the SER. The restrictions were imposed because we had not incorporated certain update corrections to known coding errors in RELAP5/MOD1, Cycle 18. The restrictions placed on Items 1, 2, and 4 can remain since we do not intend, nor foresee a need, to use these specific models. However, we need to remove the restriction in Item 3 which states:

> 3) Cannot use valve component with form loss coefficients.

In order to generalize RELAP5YA applications and to remove this restriction, we have now incorporated the RELAP5/MOD1, Cycles 19 to 29 updates that pertain to valve components. The specific updates are identified in Attachment A and modify the ICOMPN, RVALVE, and VALVE subroutines. The coding was verified. Each valve type, viz. trip, check, inertial, motor, and servo, was then tested with code versions before and after the updates. We are satisfied with these changes and the results. Therefore, we request that the restriction on our use of valve components with form loss coefficients be removed in Sections 2.3 and 3.0 of the SER.

Additional HUXY Information

During discussions associated with the NRC review of the Vermont Yankee LOCA Licensing Analysis Method, the NRC staff requested additional information concerning the HUXY code. Reference (f) provided information in response to the specific requests. Reference (g) transmitted the information directly to the staff reviewer along with copies of other docketed information that was referred to in Reference (f). However, Regulatory Position 4 in Section 3.0 of the SER does not incorporate the information on the HUXY code that was provided in References (f) and (g).

Subsequent discussions between YAEC and the NRC staff have clarified the final NRC concerns and the need for YAEC to provide additional information. The following information addresses these issues.

Reterences (f) and (g) provided information on the HUXY code in the following areas:

1. YAEC's use of the HUXY code in the Vermont Yankee BWR LOCA Licensing Analysis Method;

2. Brief summary of the HUXY code development history and NRC/NRR review for LOCA licensing analyses; and

3. YAEC's use of the HUXY code in PWR LOCA licensing analyses for the Yankee Nuclear Power Station.

A subsequent question was asked by the NRC staff concerning whether the HUXY code has ever been approved for LOCA licensing analyses associated with BWR fuel assemblies. Item (e) on Page 3 of Reference (f) identifies the NRC/NRR SER for Exxon Nuclear Company's ECCS Non-Jet Pump BWR Fuel Heatup Model. This report includes a review and approval of the HUXY code that is part of the Exxon model. Further information is contained in Section (d) of Attachment B to Reference (g).

Finally, a request was made for a set of hand-calculated radiation view factors to compare with HUXY computed view factors to verify the correctness of the HUXY values. Attachment B hereto, responds to that request. These results verify that HUXY does compute the radiation view factors accurately.

We trust that this submittal adequately addresses all concerns expressed by the NRC associated with the RELAP5YA and HUXY code review. Based upon your review of this new information, we request that a supplemental SER to Reference (b) be issued that contains the following:

1. Corrects the two typographical errors to avoid future misunderstandings.

2. Removes Item 3 from Section 2.3, and reflects this change in Section 3.0, Regulatory Position, Item 3.

3. Provides a finding that sufficient information on the HUXY code has been submitted by YAEC, has been reviewed by the USNRC staff and, therefore, finds that the HUXY code is approved for use by YAEC in LOCA analyses for VYNPS.

Accordingly, we request your review of the RELAP5YA and HUXY codes be completed by April 4, 1988 in accordance with the schedule established for the staff's review of the Vermont Yankee LOCA Licensing Analysis Method.

The enclosed information (Attachment B) is considered proprietary by YAEC and the Vermont Yankee Nuclear Power Corporation. In accordance with 10CFR2.790(b)(1), an affidavit attesting to the proprietary nature of the attachment is provided following this letter. We therefore, request that Attachment B to this letter be withheld from public disclosure.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

R. W. Capstick

R. W. Capstick, Licensing Engineer
Vermont Yankee Nuclear Power Corporation

RWC/16.280

Enclosures

WITHHOLD ATTACHMENT B FROM PUBLIC DISCLOSURE

AFFIDAVIT PURSUANT

TO 10CFR2.790

Yankee Atomic Electric Company)
Nuclear Services Division)
Commonwealth of Massachusetts)
Middlesex County) SS:

I, J. DeVincentis, depose and say that I am the Vice President of Yankee Atomic Electric Company, duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary. I am submitting this affidavit in conformance with the provisions of 10CFR2.790 of the Commission's regulations for withholding this information.

The information for which proprietary treatment is sought is contained in Attachment B to our letter, Vermont Yankee Nuclear Power Corporation to U. S. Nuclear Regulatory Commission, dated January 26, 1988.

Pursuant to the provisions of Paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The material contained in this transmittal was obtained at considerable expense to Yankee Atomic Electric Company and Vermont Yankee Nuclear Power Corporation and the release of which would seriously affect our competitive position.

2. The material contained in this transmittal is of the type customarily held in confidence and not customarily disclosed to the public.

3. This information is being transmitted to the Commission in confidence under the provisions of 10CFR2.790 with the understanding that it is to be received in confidence by the Commission.

4. This information is for Commission internal use only and should not be released to persons or organizations outside the Directorate of Regulation and the ACRS without prior approval of Yankee Atomic Electric Company. Should it become necessary to release this information to such persons as part of the review procedure, please contact Yankee Atomic Electric Company.

Further deponent sayeth not.

Sworn to before me this
26th day of January 1988

John DeVincentis

J. DeVincentis
Vice President

Gerard R Soucy

A. R. Soucy, Notary Public
My Commission Expires August 29, 1991

ATTACHMENT A

Updates to Correct RELAP5YA Valve Subroutines

NRC Question 1.20 in Reference A1 provided a summary of INEL updates to RELAP5/MOD1 to go from Cycle 18, the version used to develop RELAP5YA, to Cycle 29, the final version of RELAP5/MOD1. The question asked Yankee Atomic Electric Company (YAEC) to state for each update whether it was (1) incorporated as written by the INEL RELAP5 developers, (2) incorporated, but in modified form; or (3) not included in RELAP5YA. YAEC's response was provided in Answer 1.20 of Reference A2.

Recently, we have incorporated and tested those INEL updates, contained in Reference A3, that correct and/or clarify the coding for valve subroutines. The following information identifies the INEL updates and describes our implementation similar to the format used in our Answer A1.20. Each item has been given a number that contains the cycle number to the left of the decimal and a consecutive number within that update to the right of the decimal. The INEL summary of the specific update item is given, followed by a brief description of our implementation of that item.

21.7 Valve updates which fix the interpolation over form loss rather than CSUBV.

Subroutines modified: ICOMPN, RVALVE, VALVE

This update was incorporated as written (AW).

22.1 Corrects input and initialization for check, trip, and swing check valves. Also corrects plot scaling error.

Subroutines modified: ICOMPN, RVALVE, VALVE, PLOTS

All of the update changes related to valves (ICOMPN, RVALVE, and VALVE) were incorporated. Also, a modification in Update 29.1 to correct the

ATHROAT variable for inertial valves in the VALVE subroutine was incorporated with this update. The changes to the PLOT subroutine were not implemented; they are not related to the valve corrections.

29.1 Fix VOLVEL, calculate momentum VISC terms in VOLVEL as derived in the manual. Store these in DIFVF and DIFVG. Fix indefinite in accumulator state, and fix inertial valve ATHROAT in VALVE.

Subroutine modified: STATE, VALVE, VEXPLT, VOLVEL

The update to the VALVE subroutine corrects an error that was created in Update 22.1. This correction was incorporated in our implementation of Update 22.1 discussed above. The other changes are not directly related to valves, but were incorporated in modified form earlier in RELAP5YA as discussed in our Answer A1.20 (Reference A2).

REFERENCES

A1. Letter, P. Wheatley (INEL) to C. Graves and S. Sun (NRC), "Questions Resulting From the Review of RELAP5YA," PDW-8-86, EG&G Idaho, Incorporated; dated September 4, 1986.

A2. Letter, R. W. Capstick (YAEC) to V. L. Rooney (NRC), "Response to Additional NRC Questions on the RELAP5YA Computer Code," FVY 86-104, Yankee Atomic Electric Company, dated November 4, 1986 (Docket No. 50-271).

A3. Letter, E. C. Johnson (INEL) to T. Fernandez (YAEC), "Transmittal of RELAP5/MOD1 Updates," ECJ-66-85, EG&G Idaho, Incorporated; dated August 19, 1985.